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|---------------|--------|---|----------|---|--|
| SEQ ID NO: 6 | soy | 1 M----- | 1 M----- | * | |
| SEQ ID NO: 11 | wheat | 1 M----- | 1 M----- | | |
| SEQ ID NO: 12 | MTHFR1 | 1 M----- | 1 M----- | | |
| SEQ ID NO: 13 | MTHFR2 | 1 M----- | 1 M----- | | |
| SEQ ID NO: 14 | corn | 1 M----- | 1 M----- | | |
| SEQ ID NO: 15 | human | 1 MCRGCGCLPPDACPCTLCSSRNPAWVNNEARGNSSLNPCLEGSASSGSESSKDDSSRCSTPGL | 1 M----- | | |
| SEQ ID NO: 16 | MET13 | 1 M----- | 1 M----- | | |
| | | 1 | 60 | | |
| SEQ ID NO: 6 | soy | 2 -----KIEKIHAASADPNRVRVFSFFPPKTEDGVNDLFERMDRMVVHN-PSFCDITW | 1 | | |
| SEQ ID NO: 11 | wheat | 1 | | | |
| SEQ ID NO: 12 | MTHFR1 | 2 -----KVVDKI-KSVTEQQQTAFSEEFFPPKTEDGVENLFERMDRLVSYG-PTFCDITW | 1 | | |
| SEQ ID NO: 13 | MTHFR2 | 2 -----KVIDKI-QSLADEGKTAFSEEFFPPKTEDGVNDLFERMDRMVAYG-PTFCDITW | 1 | | |
| SEQ ID NO: 14 | corn | 2 -----KVIEKILEAAGD-GRTAFSEFYFPPKTEEGVENLFERMDRMVAHG-PSECFDITW | 1 | | |
| SEQ ID NO: 15 | human | 61 DPERHERLREKMRRL-ESGDKWFSLEFFPPRTAEGAVNLISRFDRMAAGG-PLYIDVTW | 1 | | |
| SEQ ID NO: 16 | MET13 | 2 -----KITEKLEQHRQTSGKPTYSFSEYFVPKTTQGVQONLYDRMDRMYEASLPQFIDITW | 1 | | |
| | | 61 | 120 | | |
| SEQ ID NO: 6 | soy | 55 -----GAGGTTADLTLEIANKMQNIVCVETMMHLTCTNMMPVEKIDHALHTIKSNGLQNVLA | 1 | | |
| SEQ ID NO: 11 | wheat | 1 | | | |
| SEQ ID NO: 12 | MTHFR1 | 54 -----GAGGSTADLTLEIASRMQNVICVETMMHLTCTNMMPIEKIDHALETIRSNQIQNVLA | 1 | | |
| SEQ ID NO: 13 | MTHFR2 | 54 -----GAGGSTADLTLDIASRMQNVVVCVESMMHLTCTNMMPVEKIDHALETIRSNQIQNVLA | 1 | | |
| SEQ ID NO: 14 | corn | 54 -----GAGGSTADLTLEIANRMQNVMVCVETMMHLTCTNMMPVEKIDHALETIKSNGIQQNVLA | 1 | | |
| SEQ ID NO: 15 | human | 119 HPAGDPGSDKETSMMIASTAVNYCGLETILHMTCCRQRLLEEITGHLHKAKQLGLKNIMA | 1 | | |
| SEQ ID NO: 16 | MET13 | 56 NAGG---GRLSHLISTDLVATAQSVLIGLETCMHLTCTNMPIISMDDALENAYHSGCQNLIA | 1 | | |
| | | 121 | 180 | | |

Title: Tetrahydrofolate Metabolism Enzymes

Applicant: S. C. Falco et al.

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| SEQ ID NO: 6 | soy | 111 | LRGDPPPHGQDKFVQVEGGFACARDLVQHIRAKYGYDFG GITVAGYPEAHPDVIESDGLATS |
| SEQ ID NO: 11 | wheat | 1 | -----CALDLVEHTKAKYGYDFG GITVAGYPEAHPEVILGEEGATE |
| SEQ ID NO: 12 | MTHFR1 | 110 | LRGDPPPHGQDKFVQVEGGFACALDLVNHIRSKYGYDFG GITVAGYPEAHPDVIEADGLATP |
| SEQ ID NO: 13 | MTHFR2 | 110 | LRGDPPPHGQDKFVQVEGGFACALDLVNHIRSKYGYDFG GITVAGYPEAHPDVIGENGASN |
| SEQ ID NO: 14 | corn | 110 | LRGDPPPHGQDKFVQVEGGFACALDLVNHIRSKYGYDFG GITVAGYPEAHPDAIQGEGGATL |
| SEQ ID NO: 15 | human | 179 | LRGDPI--GDQWEEEEGGFNYAVDLWKHIRSEFGDYFDICVAGYFKGHPEA----- |
| SEQ ID NO: 16 | MET13 | 113 | LRGDPPPRDAENWT PVEGGFQYAKDLIKYIKSKYGDHFAIGVAGYPECHPEL----- |
| | | 240 | |
| | | 181 | |

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| SEQ ID NO: 6 | soy | 171 | EGYONDILAYLKSKVUDAGDLIVTQLFYDTDFILKFVNDCRQIGITCPIVPGIMPINNYKG |
| SEQ ID NO: 11 | wheat | 41 | EAYSKDLAYLKRVVDAGDVIVTQLFYDTDFILKFVNDCRQIGITCPIVPGIMPINNYKG |
| SEQ ID NO: 12 | MTHFR1 | 170 | ESYQSDLAYLKKKVUDAGDLIVTQLFYDTDFILKFVNDCRQIGINCPIVPGIMPINNYKG |
| SEQ ID NO: 13 | MTHFR2 | 170 | EAYQSDELEYLKKKIDAGDLIVTQLFYDTDFILKFVNDCRQIGISCPIVPGIMPINNYRG |
| SEQ ID NO: 14 | corn | 170 | EAYSNDILAYLKRVVDAGDLIVTQLFYDTDFILKFVNDCRQIGITCPIVPGIMPINNYKG |
| SEQ ID NO: 15 | human | 228 | GSFEADLKHKEKVSGADFIITQLEFEADTFERFKACTDMGITCPIVPGIFPIQGYHS |
| SEQ ID NO: 16 | MET13 | 166 | KDVKLIDLEYLSRR-STGGDFIITQMFYDVDNLLNWCSQVRAGMDVPIIPGIMPITYAA |
| | | 241 | |
| | | 300 | |

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| SEQ ID NO: 6 | soy | 231 | FIRMTGFCKTKI PADIMAALEPIKDNEEAVKAYGIHLGTEMCKKILLAHG-INTLHLYTLN |
| SEQ ID NO: 11 | wheat | 101 | FVRMTGFCKTKI PAEITAALDPIKDNNEAVKAYGIHLGTEMCKKILLASG-IKTLHLYTLN |
| SEQ ID NO: 12 | MTHFR1 | 230 | FLRMAGFCKTKI PAELTAALEPIKDNEAVKAYGIHLGTEMCKKILLAHG-ITSLHLYTLN |
| SEQ ID NO: 13 | MTHFR2 | 230 | FLRMTGFCKTKI PVEVMAALEPIKDNEAVKAYGIHLGTEMCKKILLAHG-VKSLHLYTLN |
| SEQ ID NO: 14 | corn | 230 | FLRMTGFCKTKI PSEITAALDPIKDNNEAVRQYGIHLGTEMCKKILLATG-IKTLHLYTLN |
| SEQ ID NO: 15 | human | 288 | LRQLVKLSKLEVQEIKDVIIEPIKDNDAAIRNYGIELAVSLLCQEILLASGLVPGLHFYTTLN |
| SEQ ID NO: 16 | MET13 | 225 | FLRRIQWQGQISIPQHFSSRLDPIKDDDELVRDIGTNLIVEMCQKILLDSGYVSHLHIYTMN |
| | | 301 | |
| | | 360 | |

FIG. 1B

| | | | | |
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| SEQ ID NO: 6 | soy | 290 | MEKSALAILMNGLLIEETKVRSR-----LPWRRPANVFRVKEDVRPIFWANRPKSYISRT | X |
| SEQ ID NO: 11 | wheat | 160 | MEKTALAILMNGLLIEESKLSRT-----LPWRRPTNVFRVKEDVRPIFWANRPKSYISRT | * |
| SEQ ID NO: 12 | MTHFR1 | 289 | VDKSAIGILMNGLIDESKISRS-----LPWRRPANVERTKEDVRPIFWANRPKSYISRT | * |
| SEQ ID NO: 13 | MTHFR2 | 289 | MEKSALAILMNGLMIDESKISRS-----LPWRRPANVERTKEDVRPIFWANRPKSYISRT | * |
| SEQ ID NO: 14 | corn | 289 | MDKSAIGILMNGLLIEESKVSRP-----LPWRRPATNVFRVKEDVRPIFWANRPKSYISRT | * |
| SEQ ID NO: 15 | human | 348 | REMATTEVLKRLGMWTEDP-RRP-----LPWALSAHPKRREEDVRPIFWASRPKSYIYRT | * |
| SEQ ID NO: 16 | MET13 | 285 | LEKAPLMILERLNILPTESEENAHPLAVLPWRKSLNPKRKNEEVRPIFWKRRPYSYVART | * |
| | | 361 | | 420 |
| SEQ ID NO: 6 | soy | 345 | IGW--DQYPHGRWGDSCNPSYGALS--DYG--FMRPRARDKKLVEEWAFLKSIEDIYER | * |
| SEQ ID NO: 11 | wheat | 215 | TGW--DQYPHGRWGDSRNPSYGAHL--DHQ--FTRPRGRGKKLQEEWAFLKSVDIYER | * |
| SEQ ID NO: 12 | MTHFR1 | 344 | KGW--NDFPHGRWGDSHSAAYSTLS--DYQ--FARPKGDRDKKLQEQMVVPLKSIEDVQEKF | * |
| SEQ ID NO: 13 | MTHFR2 | 344 | KGW--EDEPQGRWGDSRSASYGALS--DHQ--FSRPRARDKKLQEQMVVPLKSVEDIYEQK | * |
| SEQ ID NO: 14 | corn | 344 | LGW--DQYPHGRWGDSRNPSYGAHL--DHQ--FTRPRGRGKKLQEEWAFLKSVEDIYER | * |
| SEQ ID NO: 15 | human | 402 | QEW--DEFPNGRWGNSSSPAFGELK--DYYLEYLKSKSPEELLKMWGEELTSEASVFEV | * |
| SEQ ID NO: 16 | MET13 | 345 | SQWAVDEFPNGRFGDSSSPAFGDLILCGSDLI----RQSANKCLELWSTP-TSINDVAFL | * |
| | | 421 | | 480 |
| SEQ ID NO: 6 | soy | 399 | FRLYCLG-----KLRSNPWSELDGLOQPETKINELLEKINTKGFLTINSQPAVNGERS | * |
| SEQ ID NO: 11 | wheat | 269 | FVNFCEG-----KLKSSSPWSELDGLOQPETTIIDDQLVKINSKGFLTINSQPAVNAEKS | * |
| SEQ ID NO: 12 | MTHFR1 | 398 | EKELCIG-----NLKSSSPWSELDGLOQPETKINEQLGKINSNGFLTINSQPSVNAEKS | * |
| SEQ ID NO: 13 | MTHFR2 | 398 | EKELCIG-----NLKSSSPWSELDGLOQPETRIINEQLGKINSNGFLTINSQPSVNAEKS | * |
| SEQ ID NO: 14 | corn | 398 | FTNEFCQG-----KLTSSSPWSELDGLOQPETKIIDDQLVNINQKGFLTINSQPAVNGEKS | * |
| SEQ ID NO: 15 | human | 458 | FVLYLSGEPNRNGHKVTCLPWND-EPLAAETSSLKEELLRVNRQGILTINSQPNINGKPS | * |
| SEQ ID NO: 16 | MET13 | 400 | VINYLING-----NLKCLPWSDI-PINDEINPIKAHLIELNOHSITITINSQPVNGIRS | * |
| | | 481 | | 540 |

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| SEQ ID NO: 6 | soy | 452 | DSPTVGWGGPGGVYQKAYVEFFCSKEKLDALVDKCKDRT-SLTYMAVNKDGWSWKSNVGQ | * | |
| SEQ ID NO: 11 | wheat | 322 | ESPSVGVWGGPGGVYQKAYVEFFCAKEKILQQLIEKSKAFF-SLTYIAVNKEGESISNIPA | * | |
| SEQ ID NO: 12 | MTHFR1 | 451 | DSPAIGWGGPGGVYQKAYLEFFCSKDKLDTLVEKSKAFF-SLTYMAVNKENWVSNTGE | * | |
| SEQ ID NO: 13 | MTHFR2 | 451 | DSPTVGWGGPGVGVYQKAYLEFFCSKEKLDLVVEKCKALP-SLTYMAVNKEQWVSNTAQ | * | |
| SEQ ID NO: 14 | corn | 451 | DSPTVGWGGPGGVYQKAYLEFFCAKEKLDQLIKEKIAFP-SLTYIAVNKDGETFSNISP | * | |
| SEQ ID NO: 15 | human | 517 | SDPIVGWGPSGGYVFQKAYLEFFTSRETAEALLQVLKKYELRVNXYHLVNVKGENITNAPE | * | |
| SEQ ID NO: 16 | MET13 | 452 | NDKIHGWPKGPKDGVYQKAYLEFMLPKTLPKLIDTLKNNNEF-LTYFAIDSQGDLLSNHPD | 600 | |
| 541 | | | | | |
| SEQ ID NO: 6 | soy | 511 | TD-VNAVVTWGVFPAKEIIQOPTIVDPVSENWKDEADEFIWSRGWA---SLYPEGDASRKLV | * | |
| SEQ ID NO: 11 | wheat | 381 | NA-VNAVVTWGVFPGKEIIQOPTIVDPVDSASFMVWKDEADEFIWSRGWA---CLFPEGDSSRELL | * | |
| SEQ ID NO: 12 | MTHFR1 | 510 | SD-VNAVVTWGVFPAKEVIQOPTIVDPASEFKVWKDEADEFIWSRSWA---NLYPEDDPSRKL | * | |
| SEQ ID NO: 13 | MTHFR2 | 510 | AD-VNAVVTWGVFPAKEIIQOPTIVDPASFNWKDEAFETWSRSWA---NLYPEADPSRNLL | * | |
| SEQ ID NO: 14 | corn | 510 | NA-VNAVVTWGVFPGKEIIQOPTIVDPVDSASFMVWKDEADEFIWTTRGMG---CMFPEGDSSRELL | * | |
| SEQ ID NO: 15 | human | 577 | LQ-PNAVVTWGWIFPGREIIQOPTVVDPVSEMFWKDEAFALWIERWG---KLYEEEESPSRTII | * | |
| SEQ ID NO: 16 | MET13 | 511 | NSKSNAVTWGWIFPGREILOQPTIVEKISFLAWKEEFYHILNE-WKLNMMNKYDKPHSAQ-FI | 660 | |
| 601 | | | | | |
| SEQ ID NO: 6 | soy | 567 | EEVGSSYFLVSLVNDYINGD-LFTVFAFD----- | 595 | |
| SEQ ID NO: 11 | wheat | 437 | EIQOKSYYLVLVSLVNDYINGD-LFAAFKEI----- | 465 | |
| SEQ ID NO: 12 | MTHFR1 | 566 | EEVKNSYYLVLVSLVNDYINGD-IFSVFA----- | 592 | |
| SEQ ID NO: 13 | MTHFR2 | 566 | EEVKNSYYLVLVENDYINGD-IFAVFADL----- | 594 | |
| SEQ ID NO: 14 | corn | 566 | EKVQKTYYLVLVSLVNDYQGD-LFAAFK-I----- | 593 | |
| SEQ ID NO: 15 | human | 633 | QYIHDNYFLVNLVDFPLDNCLWQVVEDTLELLNRPTQNARETEAP | 679 | |
| SEQ ID NO: 16 | MET13 | 569 | QSLIDDYCLVNIVDNDYISSPD---DQIHSILLSL----- | 599 | |
| 661 | | | | | |
| SEQ ID NO: 6 | soy | 567 | EEVGSSYFLVSLVNDYINGD-LFTVFAFD----- | 595 | |
| SEQ ID NO: 11 | wheat | 437 | EIQOKSYYLVLVSLVNDYINGD-LFAAFKEI----- | 465 | |
| SEQ ID NO: 12 | MTHFR1 | 566 | EEVKNSYYLVLVSLVNDYINGD-IFSVFA----- | 592 | |
| SEQ ID NO: 13 | MTHFR2 | 566 | EEVKNSYYLVLVENDYINGD-IFAVFADL----- | 594 | |
| SEQ ID NO: 14 | corn | 566 | EKVQKTYYLVLVSLVNDYQGD-LFAAFK-I----- | 593 | |
| SEQ ID NO: 15 | human | 633 | QYIHDNYFLVNLVDFPLDNCLWQVVEDTLELLNRPTQNARETEAP | 679 | |
| SEQ ID NO: 16 | MET13 | 569 | QSLIDDYCLVNIVDNDYISSPD---DQIHSILLSL----- | 599 | |
| 707 | | | | | |